

Clinicopathological study of vascular tumors of the breast: a series of ten patients with a long follow-up

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Summary

Ten cases of vascular tumors of the breast were examined in our laboratory during the last decade (1992-2001). Nine patients were female and one male (ages 31-77, average 52 years).

Six patients presented parenchymal vascular lesions (1 angiosarcoma, 1 atypical hemangioma, 3 perilobular hemangiomas, 1 cavernous hemangioma) measuring 0.5-6 cm in the greatest diameter. Two lesions were accidental findings in lumpectomy specimens excised for fibrocystic disease with microcalcifications. Four patients presented non-parenchymal vascular lesions: three cavernous hemangiomas (one in a male patient) and one angioliopoma measuring 1-6 cm in diameter.

All tumors were treated by lumpectomy with the exception of the atypical hemangioma which was treated by simple mastectomy.

The patient with the angiosarcoma was treated by simple mastectomy, radiotherapy and chemotherapy and died with disseminated disease three years after initial diagnosis.

All other patients are well up to date (follow-up 1-9 years).

Key word: Breast; Hemangiomas; Angiosarcoma.

Introduction

Vascular tumors of the breast are rare lesions comprising 0.5% of mammary gland neoplasms [1,2]. The majority of these neoplasms reported are malignant [3-5]. Most authors consider that benign vascular lesions of the breast are extremely rare, never producing palpable masses and emphasize the need of extreme caution when examining grossly evident vascular tumors with bland histology [1, 6].

Rosen presented conclusive evidence that symptom-producing benign breast vascular tumors exist, based on the analysis of more than 300 breast vascular tumors with a long follow-up. He proposed a classification of these tumors based on clinico-pathological patterns and divided them into parenchymatous and non-parenchymatous vascular breast lesions [1].

According to this classification, parenchymatous lesions consist of hemangiomas-perilobular, cavernous, capillary or complex, angiomatosis and venous hemangiomas. Non-parenchymatous tumors consist of subcutaneous hemangiomas, angioliopomas and papillary endothelial hyperplasia [1]. Breast vascular tumors are usually observed in middle-aged women, as soft, well demarcated lesions measuring 0.5-7 cm [7, 8].

These lesions are often discovered at a routine mastography, during palpation or as accidental findings in breast tissue specimens excised for various epithelial lesions.

In this study we present the clinicopathological features of nine benign and one malignant vascular neoplasm of the breast examined in our laboratory during the last decade.

Material and Method

From 1992-2001 at the Areteion Hospital Pathology Laboratory, 1250 breast biopsies and specimens were examined from the Breast Unit of the 2nd Surgical Clinic of Athens University Medical School. More than half of these cases (720) were malignant epithelial tumors, seven cases were phyllodes tumors, ten cases were vascular tumors of the breast and the rest presented various benign breast lesions. All cases showing vascular tumors were archive-retrieved and re-examined.

Clinical information was obtained from the Breast Unit files and a 1-9 year follow-up was available in all cases. Classification was based on the criteria proposed by Jozeczyk and Rosen [2] and Rosen *et al.* [4, 9, 11-13].

All sections were stained with hematoxylin-eosin and new sections were obtained for additional study.

Results

Clinical features: Nine patients were female and one male.

The age of patients ranged from 31-77 years (the oldest being the male patient) with a mean age of 32 years. In eight cases, the vascular lesions had a size ranging from 0.5 to 6 cm and were found by mammography or palpation and were excised.

Two lesions measuring 0.3-0.5 cm were incidental findings in biopsy specimens removed for fibrocystic disease with microcalcifications.

In all cases, lumpectomy was performed initially, followed by simple mastectomy in two cases. In six cases the lesions was located in the right breast and in four cases at the left.

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Histology: Six tumors presented morphological features of parenchymatous vascular lesions and four of non-parenchymatous lesions.

The *parenchymatous* lesions presented the histology of cavernous hemangioma (1/6), perilobular hemangioma (3/6) and atypical hemangioma (1/6). In the last case, because of the large size of the tumor (6 cm) and extension of vascular spaces to the surgical margins, a simple mastectomy was performed.

One patient, 35 years old, presented a vascular lesion of the right breast with features of low-grade angiosarcoma, measuring 1 cm in diameter. She was treated by simple mastectomy, radiotherapy and chemotherapy. A year later angiosarcomatous lesions were found in the same and in the contralateral (left) breast as well, and the patient died three years after the initial diagnosis with disseminated disease.

Of the four non-parenchymatous tumors, of particular interest is the case of a large (6 cm) subcutaneous cavernous hemangioma in a male patient, 77 years of age, with bilateral gynecomastia. The tumor was observed after a breast injury, as a large bluish "bruise". It was totally excised and the patient is well three years after surgery.

Another patient presented a subcutaneous angioliipoma, 0.7 cm in diameter, and two patients presented hemangiomas of the cavernous type, 1-1.5 cm in diameter, subcutaneous as well.

Discussion

Angiosarcoma of the breast is usually a palpable breast mass with initial presentation as a "bluish bruise" in young patients (mean age 34 years).

They are a morphologically heterogeneous group of neoplasms and may be divided into primary and post-mastectomy breast angiosarcomas.

Vascular tumors arise from breast stroma in the cutaneous tissue or on the chest wall in the case of post-mastectomy and radiotherapy sarcoma [3-6].

Our case of breast angiosarcoma in a young woman, unique among the 1,250 examined breast biopsies and the 720 cancers, presented both a low grade of malignancy and small size which are considered as good prognostic signs but recurred in the same and the contralateral breast and disseminated to major organs, causing the death of the patient three years after initial diagnosis.

It should be noted that this case presented diagnostic difficulty as well because of the bland morphology of the endothelial cells, the minimal nuclear atypia and the rare mitotic activity which suggested a benign lesion.

The treatment of choice for angiosarcoma of the breast is lumpectomy with free margins or simple mastectomy without axillary dissection. Survival rates are poor and of prognostic significance are the size and the grade of the tumor, which is based on the overall pattern, cellular, atypia and mitotic rate [4].

Hemangiomas can be either macroscopic or microscopic lesions usually measuring 2 cm or less in diame-

ter (perilobular hemangiomas). In contrast to our results they are reported less often than angiosarcomas and present atypical morphology in 30-50% of the cases [11-15].

Perilobular hemangiomas are incidental findings in 1-2% of mastectomy or biopsy specimens excised for cancer, or various other benign breast lesions, and in 11% of autopsy material [6-8]. Jozefczyk and Rosen [2] reported that out of 100 vascular tumors of the breast, 62 were angiosarcomas, 24 hemangiomas and the remainder various types of benign tumors. Of the 24 hemangiomas, 11 were microscopic, five of them atypical and 13 palpable, and measured 1-2.5 cm in diameter.

All typical and atypical lesions were treated by lumpectomy. No recurrence was observed in cases with free margins.

Atypical lesions show nuclear hyperchromasia and/or focal and (minimal) anastomoses of vascular channels and can be confused with low-grade angiosarcomas [15]. Whether these atypical lesions are precursors to angiosarcoma is not clear at present. Two of our patients had hemangiomas (one atypical) and three perilobular hemangiomas with typical features that did not present any diagnostic difficulty.

All our cases were treated by excision with the exception of a large (5 cm) atypical hemangioma which was treated by simple mastectomy. Follow-up of our cases from two to nine years showed no recurrence of the lesions.

Venous hemangioma is a very unusual benign vascular tumor of the breast. Microscopically it shows vascular proliferation mainly of venous channels with a rare or completely absent arterial component. Rosen *et al.* [10] reported four cases treated by lumpectomy followed for 11 years without recurrence.

Another unusual benign vascular tumor of the breast is angiomatosis, similar to soft tissue angiomatosis found in other anatomic sites. It appears as a breast mass, usually of large size. Rosen [12] reported three patients with tumors measuring 9, 9.3 and 10 cm in diameter. Microscopically the tumor shows both angiomatous and lymphangiomatous vascular channels, growing diffusely in breast parenchyma, in contrast to the circumscribed pattern of mammary hemangiomas. The presence of anastomosing vascular channels and vessels devoid of erythrocytes makes differentiation from low-grade angiosarcoma difficult. Complete excision of the tumor is indicated. We had no case of either venous hemangioma or angiomatosis.

In the category of nonparenchymal hemangiomas tumors of the subcutaneous breast tissue are included but not dermal or cutaneous hemangiomas [13-15]. They appear as soft circumscribed masses, in middle-aged women. Histologically they are of various types but most of them are angioliipomas or cavernous hemangiomas and all are virtually benign. However, complete excision is recommended for histologic confirmation of the diagnosis and exclusion of angiosarcoma arising from the breast parenchyma and extending subcutaneously.

Four of our patients were found to have non-parenchymal hemangiomas. One case measured 0.7 cm in diameter and it was an angiolipoma with local endothelial hyperplasia. The other three cases were cavernous hemangiomas, and one of these is of special interest because it developed in a 77-year-old male. It was removed under local anesthesia with the overlying skin and underlying muscle to which the mass was adherent. Histologically the tumor showed local papillary endothelial hyperplasia, but it was a benign lesion and was completely removed with wide margins. Three years after surgery at the age of 80, he is in good health with no evidence of tumor recurrence. A review of the recent literature adds five cases of breast hemangiomas in male patients that presented as palpable masses [14].

We verify the presence of benign vascular tumors in the breast, which can be diagnosed by applying strict diagnostic criteria. The correct diagnosis of benign and malignant vascular breast lesions is imperative in order to plan the correct therapy.

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